MAJOR FISHERY RESEARCH GOALS AND OBJECTIVES

The major fishery research goals of NMFS have a one-to-one correspondence with the program areas identified in the MSFCMA except that a fifth element has been added to help focus efforts on building partnerships. All Federal agencies operate in an environment of increasing demands competing for limited resources. To meet this challenge, NMFS is increasing its collaborative efforts with other NOAA line offices and their programs (e.g., Sea Grant, National Undersea Research Program, Coastal Ocean Program), other Federal, state and local agencies, universities, Native American tribes, Pacific Islanders, the commercial and recreational fishing industries, environmental groups, and international organizations. NMFS is committed to strengthening existing relationships and building new ones.

Strategic planning usually includes the use of timetables for performance of the various activities associated with each goal. Fisheries research has been developing for over a century. Initially, it was largely comprised of studies of fundamental life history and exploratory fishing. Routine surveys accelerated with the advent of international conservation treaties and became nationwide with the passage of the MSFCMA. Much of the research is operational in nature and will continue into the future. Issues are ever-changing, as natural and human-induced changes to ecosystems modify species distributions and abundance, marketplace preferences change, and harvesting technology evolves. For example, stock assessment surveys, the analysis of the obtained data, and the projections of future abundance, are done, when there is sufficient funding, according to a schedule. Other parts of this plan involve improvements to the science or the provision of new facilities. Where such schedules have been developed, they are provided. However, most activities go on indefinitely as the issues being addressed change. Information on whether an activity is ongoing or has a defined completion date is primarily provided in this section.

The objectives under each goal have been developed through many discussions with agency managers and staff and with stakeholders and reviewers. They generally correspond to the principal functions necessary to develop and disseminate information and advice for use by fisheries managers. They also correspond to strategies in the NFSP. To facilitate cross-reference, the corresponding NFSP strategy follows each fishery research objective below.

GOAL 1: Provide scientifically sound information and data to support fishery conservation and management. (The scope centers on factors affecting the abundance and availability of resources.)

Objective 1.1: Periodically assess stocks to ascertain whether changes in their status due to natural or human-related causes have occurred. These stock assess-

ments require adequate fishery monitoring and resource surveys. Ongoing. (NFSP Assess and Predict: Implement SAIPs)

Objective 1.2: Use stock assessments to predict future trends in stock status. Forecasts will take into account projected biological productivity, climatic information, and economic and other social forces that will affect levels of fishing effort. Ongoing. (NFSP Assess and Predict: Implement SAIPs)

Objective 1.3: Determine and reduce the level of uncertainty associated with stock assessments through improved data collection and advanced analytical techniques. Ongoing. (NFSP Assess and Predict: Implement SAIPs)

Objective 1.4: Develop implementation strategy and annual operational plans for executing the days-at-sea requirements identified in the NMFS Data Acquisition Plan (NMFS, 1998c). Ongoing. (NFSP Assess and Predict: Implement SAIPs)

Objective 1.5: Use stock assessment workshops, peer reviews, and other fora to ensure that our information and advice are developed through an open and collaborative process. Ongoing. (NFSP Assess and Predict: Implement SAIPs)

Objective 1.6: Communicate our scientific information and advice, along with the associated uncertainties, to the Councils, other management authorities, and the public. Ongoing. (NFSP Engage, Advise, and Inform)

Objective 1.7: Collaborate with the Councils and other management authorities to explore and develop fishery management regimes and alternative governance systems that will effectively control exploitation and promote sustainability. Ongoing. (NFSP Engage, Advise, and Inform)

Objective 1.8: Provide guidelines to assist the Councils in assessing and specifying Maximum Sustainable Yield (MSY) for managed fisheries. Ongoing. (NFSP Engage, Advise, and Inform)

Objective 1.9: Work with the Councils to develop objective and measurable criteria for each managed stock to determine if the stock is overfished or approaching an overfished condition. Ongoing. (NFSP Engage, Advise, and Inform)

Objective 1.10: For each stock which is overfished or approaching an overfished condition, we will develop, in collaboration with the Councils, measures to eliminate or prevent the overfishing. Ongoing. (NFSP Engage, Advise, and Inform)

Objective 1.11: Conduct additional research to provide needed information to refine initial EFH designations and to help the Councils minimize the adverse effects of fishing on EFH, as mandated by the SFA. (NFSP Understand and Describe: Habitat)

Objective 1.12: Establish an inventory of living marine resource habitats (tied to *Our Living Oceans* series (NMFS, 1999)) and implement measures to monitor

the trends in habitat availability. To be published in 2004. (NFSP Monitor and Observe: Habitat Assessments / Restoration Monitoring)

Objective 1.13: Support recommendations provided by the NRC (NRC, 1999) and the Report to Congress (EPAP, 1999) by establishing criteria to define and delineate marine, estuarine, and riverine ecosystems for management purposes, and identify indicators for assessing the status and detecting changes in the health of such ecosystems. Ongoing. (NFSP Monitor and Observe: Habitat Assessments / Restoration Monitoring)

Objective 1.14: Define the key aspects of vital habitat functions and increase our understanding of how they affect marine and anadromous species and how they are affected by human activities. This will involve the development of new methods of evaluating the quality and productivity of restored habitats, as well as improved restoration and creation technologies, including contaminant remediation, to ensure that created habitats are beneficial to fish populations. Ongoing. (NFSP Understand and Describe: Habitat)

Objective 1.15: Incorporate assessments or indices of climate variability into stock assessments. Ongoing. (NFSP Assess and Predict: Ecosystem Modeling)

Objective 1.16: Monitor climate change on interannual, decadal, and centennial scales and its impact on currently sustainable fisheries. Ongoing. (NFSP Assess and Predict: Ecosystem Modeling)

Objective 1.17: Use economic and sociocultural research to predict future trends (e.g., entry and exit behavior from industry or community, organizational structure, cultural changes, etc.) of shoreside fishing-related households and firms in fishing communities. Ongoing. (NFSP Understand and Describe: Economics & Social Sciences)

Objective 1.18: Use economic and sociocultural research to predict future trends in entry and exit of fishermen to the fishery and to assess fishing capacity. Ongoing. (NFSP Understand and Describe: Economics & Social Sciences)

Objective 1.19: Conduct economic analyses of at-sea behavior to improve current and future estimates of fishery harvest and bycatch. Ongoing. (NFSP Understand and Describe: Economics & Social Sciences)

GOAL 2: Through conservation engineering research contribute to efforts to reduce bycatch and adverse effects on EFH, promote efficient harvest of target species, and improve the data from fishery surveys.

Objective 2.1: Identify and assess the magnitude of incidental takes of protected marine species. Ongoing. (NFSP Monitor and Observe: Observers)

Objective 2.2: Establish sustainable levels of takes for all protected marine species

Steller sea lions in Southeast Alaska. Photo: David Withrow, AFSC.

and continue to improve the estimates of these levels through ecological research. Ongoing. (NFSP Assess and Predict: Ecosystem Modeling)

Objective 2.3: Work through domestic and international cooperative relationships with industry and environmental groups, including take reduction teams, special task forces, and other needed scientific collaborations. Ongoing. (NFSP Cross-Cut Priorities: International Cooperation and Collaboration)

Objective 2.4: Explore, develop, and implement new technologies and practices for reducing detrimental interactions. When such technologies could reduce detrimental effects both to and from protected species in other nations these technologies will be made available to those nations. Ongoing. (NFSP Manage: Bycatch Reduction)

Objective 2.5: Establish a standardized reporting methodology to assess the amount and type of bycatch occurring in each fishery covered by an FMP. Ongoing. (NFSP Monitor and Observe: Fisheries Information System)

Objective 2.6: Work in cooperation with the fishing industry and gear manufacturers to improve gear selectivity, design and field test new gear designs and modifications, and evaluate gear regulations. Ongoing. (NFSP Manage: Bycatch Reduction)

GOAL 3: Through economic and ecological research on marine communities and ecosystems, provide scientific data and information to increase long-term economic and social benefits to the Nation from living marine resources. (The scope centers on information about how the resources are used and its integration with information about the resources addressed in Goal 1).

Objective 3.1: For each fishery management plan, collect complete suite of economic data for commercial harvesters (variable cost, annual operating cost and revenue) and recreational anglers (expenditures on fishing boat, tackle and other trip-related expenses). Ongoing. (NFSP Monitor & Observe: Economics & Social Sciences)

Objective 3.2: For each coastal state and territory, collect economic and sociocultural data needed for analyzing and understanding fishing, fishing-related industries, and fishing communities. Ongoing. (NFSP Monitor & Observe: Economics & Social Sciences)

Objective 3.3: Establish an inventory of non-market values for protected species,

essential fish habitats, and ecosystems. Ongoing. (NFSP Monitor & Observe: Economics & Social Sciences)

Objective 3.4: Determine the costs and benefits as well as the economic and sociocultural impacts to fishery participants, shoreside firms, and fishing communities from proposed management options prior to the management decision. Ongoing. (NFSP Understand and Describe: Economics & Social Sciences)

Objective 3.5: Collect data and develop integrated biosocioeconomic models to assess the net benefits to the Nation derived from living marine resources accruing to those actively engaging in fishing-related activities, e.g., commercial harvesters, recreational users, fishing communities, and seafood consumers. Ongoing. (NFSP Monitor and Observe: Social Science); NFSP Understand and Describe: Economics & Social Sciences)

Objective 3.6: Assess the non-market value of living marine resources to the Nation. Ongoing. (NFSP Understand and Describe: Economics & Social Sciences)

Objective 3.7: Assist the Councils in reviewing optimum yield (OY) levels for consistency with economic theory and with the revised definition in the Sustainable Fisheries Act. Ongoing. (NFSP Monitor and Observe: Social Science)

Objective 3.8: Study new candidate species for culture through their complete life cycle to determine which are economically and biologically suitable for commercial culture or wild stock enhancement. Ongoing. (NFSP Manage: Aquaculture)

Objective 3.9: Determine the bioeconomic requirements for the siting of aquaculture operations in the U.S. EEZ. Ongoing. (NFSP Manage: Aquaculture)

Objective 3.10: Work with the aquaculture industry to develop, identify, evaluate, and transfer technologies that are appropriate to both economically efficient aquaculture production and environmental protection. Ongoing. (NFSP Manage: Aquaculture)

Objective 3.11: Evaluate the impacts of climate change on biological, social, and economic conditions in fishing communities and commercial and recreational sectors. Ongoing. (NFSP Assess and Predict: Ecosystem Modeling)

GOAL 4: Improve the fishery information system.

Objective 4.1: Develop implementation strategy and annual operational plans for creation of a national fisheries information system as described in the December 1998 Report to Congress (NMFS, 1998b). Ongoing. (NFSP Monitor and Observe: Fisheries Information System)

GOAL 5: Improve the effectiveness of external partnerships with fishers, managers, scientists, conservationists, and other interested groups

Objective 5.1: Promote a cooperative network of partners in the coordination of fisheries research. Ongoing. (NFSP Monitor and Observe: Industry Partnerships)

Objective 5.2: Develop infrastructure for long-term, continuous working relationships with partners to address fisheries research issues. Ongoing. (NFSP Monitor and Observe: Industry Partnerships)

Objective 5.3: Sponsor symposia and conferences for partners to exchange information and identify major fisheries research initiatives. Ongoing. (NFSP Monitor and Observe: Industry Partnerships)

Objective 5.4: Solicit partners' views on fisheries research needs. Ongoing. (NFSP Monitor and Observe: Industry Partnerships)